

The Bee Genus *Doeringiella* Holmberg (Hymenoptera: Apidae): A Revision of the Subgenus *Pseudepeolus* Holmberg

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Abstract.—A revision of the subgenus of the epeoline cleptoparasitic bees *Pseudepeolus* Holmberg is presented. These bees occur in mesophytic areas of South America. Five species are recognized, two of which are described as new: *Doeringiella (Pseudepeolus) carinata* sp. n. and *D. (P.) wil-linki* sp. n. A neotype is designated for *Pseudepeolus fasciatus* Holmberg, type species of the subgenus. *Doeringiella (Pseudepeolus) albifrons* (Smith) n. comb is transferred from *Epeolus*. A phylogenetic analysis, key to the species, descriptions and illustrations are provided.

The genus *Doeringiella* Holmberg comprises a group of cleptoparasitic bees of the tribe Epeolini, subfamily Nomadinae. Its subgenus *Pseudepeolus* Holmberg is strictly South American, with species distributed in northern Argentina, Paraguay, eastern Perú, and Brazil. This subgenus is only found in mesophytic areas, contrary to the subgenera *Doeringiella s. str.* and *Triepeolus* Robertson, which, although having species that occur in mesophytic areas, have their maximal diversity in xerophytic areas of South and North America respectively. Nothing is known about the biology of *Pseudepeolus*.

Holmberg (1886) based his monotypic genus *Pseudepeolus*, and the type species *P. fasciatus* Holmberg, on a single male specimen that is no longer preserved. Since its description, the genus went unrecognized by other authors until recently (Roig-Alsina 1989). Roig Alsina (1989) suggested its close relationship to *Doeringiella*, and included in it a second species, *Doeringiella angustata* Moure. Michener (2000) included *Pseudepeolus* together with *Triepeolus* as subgenera of *Doeringiella*, a classification that is followed here, since it emphasises the close relationship and similarity of these three groups.

Each of the three subgenera of *Doeringiella* is characterized by a distinctive antennal scape. In *Doeringiella s. str.* the scape of both sexes has a sub-basal angle on the plical surface, except in some males which have spectacularly swollen scapes. In species of *Triepeolus* the scape is broadened apically, and the short barrel-shaped pedicel is frequently hidden within its apex. In *Pseudepeolus* the males have the scape flattened on the condylar surface, which is more or less concave, the plical surface being very narrow, a condition unique among bees.

Holmberg (1886) characterized *Pseudepeolus* as having only two submarginal cells, but both in the key to genera and in the generic description he mentioned the presence of a rudiment of the cross-vein 1r-m. As a matter of fact most examined specimens of *P. fasciatus* have three submarginal cells, a condition that is characteristic of the subgenus as a whole.

Moure (1954) recognized the group as distinctive, and named it as *Doeringiella (Stenothlisa)*. The only species that he studied, *D. angustata*, is fairly derived within the group. Several characters that he thought were diagnostic at the subgeneric

level, like the anteriorly narrowed second submarginal cell, the paraocular carina separating above from the eye margin, and the rudimentary apical fimbriae of hairs on the male sterna, represent derived conditions within *Pseudepeolus*.

In this contribution five species are recognized, two of which are described as new.

MATERIAL AND METHODS

Material studied, including types, was obtained from several collections. I am indebted to the following: American Museum of Natural History, New York, J. G. Rozen, Jr. (AMNH); Fundación e Instituto Miguel Lillo, Tucumán, M. V. Colomo (FIML); Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" (MACN); Museo de La Plata, La Plata, J. Schnack and A. Abrahamovich (MLP); National Museum of Natural History, Washington, R. J. McGinley (USNM); Natural History Museum, London, C. R. Vardy and C. Taylor (London); Universidade de São Paulo, Ribeirão Preto, J. M. F. Camargo (USP-RP); Universidade Federal do Paraná, Curitiba, J. S. Moure (UFPR). The acronyms are used below to indicate depositories of specimens.

Terminology for structures and pubescence patches follows Roig-Alsina (1989). For the description of the scape, the terms *condylar* surface and *plical* surface are used. Since the antenna rotates when it is extended forwards, it is inappropriate to speak about dorsal and ventral or anterior and posterior sides. The plical surface corresponds to the plane towards which the flagellum is flexed, and the condylar surface corresponds to that where the monocondylic articulation between scape and pedicel is located. In the descriptions the metasomal terga (T) and sterna (S) are identified with Arabic numerals.

The genital capsule and sterna seven and eight of males are similar among spe-

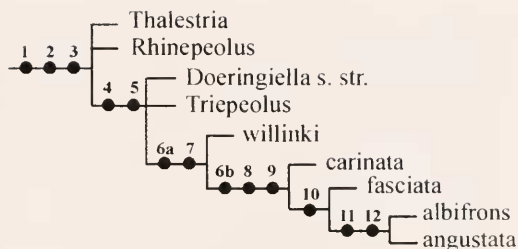


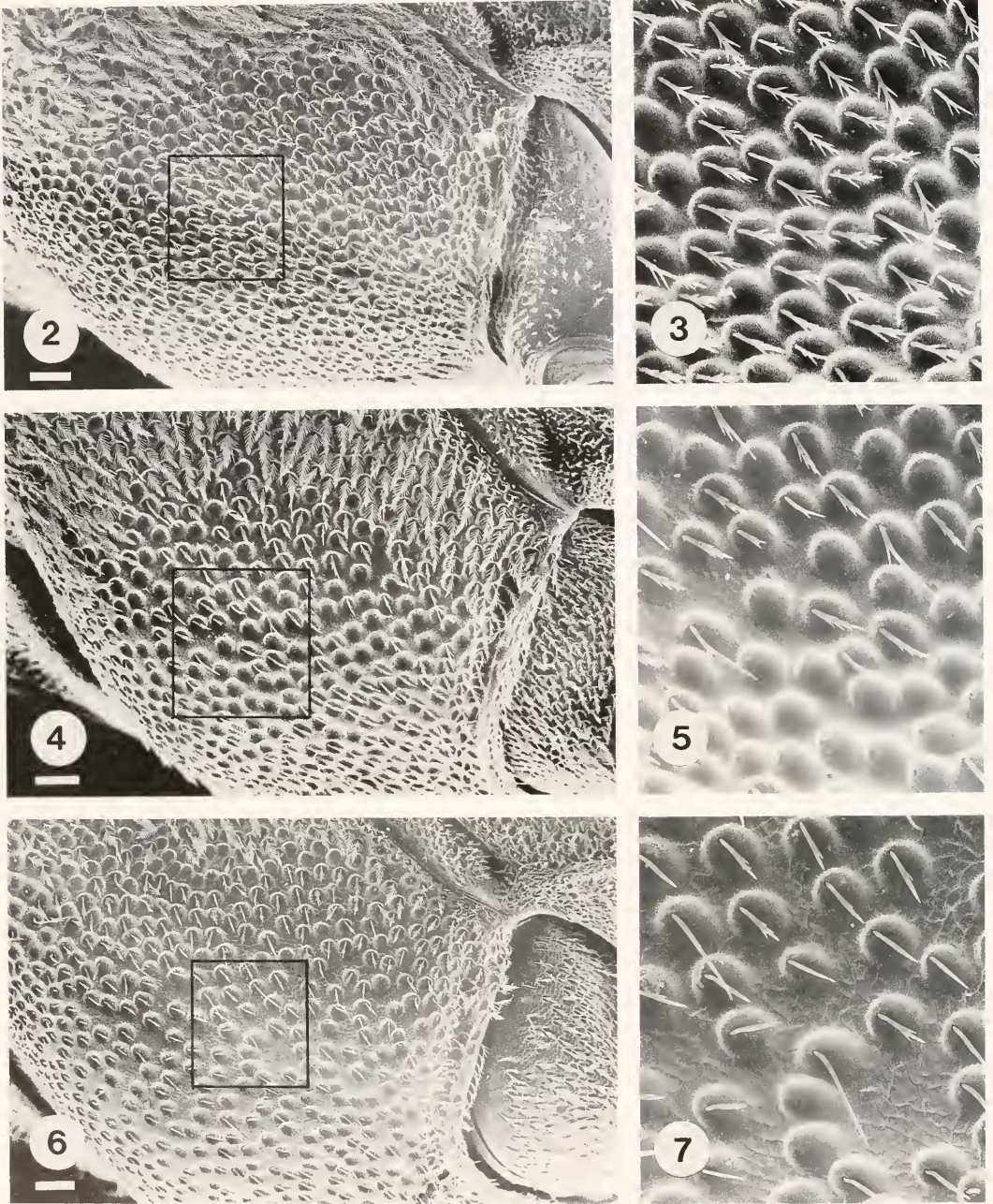
Fig. 1. Relationships of species of *Doeringiella* (*Pseudepeolus*) spp., and outgroups considered. Characters are numbered as in the text.

cies. These structures are illustrated only for the type species (Figs. 8–10).

PHYLOGENETIC RELATIONSHIPS

Relationships among species of the subgenus *Pseudepeolus* are depicted in Fig. 1. The numbers in the figure correspond to numbers in parentheses following each character discussed in the text. The tree has been constructed by hand.

Outgroups.—The relative apomorphy of the states of each character is evaluated, comparing their condition to that in species of the subgenus *Doeringiella*, in species of the subgenus *Triepeolus*, and in the monotypic genera *Thalestria* Smith and *Rhinepeolus* Moure. The three genera, *Doeringiella*, *Thalestria*, and *Rhinepeolus*, form a well defined monophyletic group within the Epeolini, supported by the peculiar structure of the female sixth sternum and characteristics of the male genitalia. In the three genera the female sixth sternum has elongate lateral arms and the disc is membranous, except for a basal transverse bar (1). *Thalestria* shows a further autapomorphic stage of this character, since all that remains of the disc is a heavily sclerotized basal bar with no membranous part. In other epeolines the disc of the sternum is recognizable. The genital capsule of the males in the three genera has the gonocoxite with a large ventral lobe (2) (Fig. 8, vl). Such a lobe is moderate in other epeolines (i.e., *Epeolus* Latreille, *Rhogepeolus* Moure, and *Odyner-*



Figs. 2-7. *Doeringiella* (*Pseudepeolus*) spp. Lower part of mesopleuron (left) and detail of punctation (right). 2-3, *D. fasciata*. 4-5, *D. carinata*. 6-7, *D. angustata*. Scale = 100 μ m.

opsis Schrottky), and small or absent in other nomadines. The three genera also share an elongate gonostylus, not curved at the base and without a dorsal protu-

berance (3), as is the case in other epeolines.

The monophyly of *Doeringiella* in the broad sense, is supported by characters of

the male genitalia. The ventral mesial margin of the gonocoxite has a conspicuous emargination (4) (Fig. 8, e) basal to the lobe mentioned above as character 2. In other epeolines the ventral mesial margin of the gonocoxite is straight. The dorsal connecting bridge of the penis valves in species of *Doeringiella* is reduced to a long bar (Fig. 8, b) between the widely separated bases of the penis valves (5). The dorsal bridge forms a plesiomorphic spatha in species of *Odyneropsis* and *Rhinepeolus*. In *Epeolus*, *Rhinepeolus*, and *Thalestria* the bridge is more or less reduced to a bar, but it is not elongate; the separation between the penis valves is equivalent to that in the genera having a spatha.

Relationships among species.—The monophyly of *Pseudepeolus* is supported by the flattened scape of the males (6); I have distinguished two stages of compression of the scape, as explained below. The monophyly of the subgenus is also supported by the shape of the genal area: the preoccipital carina (as seen in lateral view) separates dorsally from the eye margin (7), while in *Doeringiella s. str.* and *Triepeolus* the preoccipital carina approaches the top of the eye dorsally. In *Thalestria* and *Rhinepeolus* the lateral part of the preoccipital carina is more or less parallel to the eye margin.

The scape is flattened only on the proximal half of the condylar surface (6a) in one species of *Pseudepeolus* (Fig. 11); this is taken to be the basal condition of the character for the subgenus. In the remaining species the entire condylar surface is flattened (6b) (Figs. 12–13). In the latter case the upper rim of the scape is carinate near

the point of articulation of the pedicel (8). These flattened scapes are unique among bees.

Males of most Epeolini have on the third to fifth sternum apical fringes of long, curved hairs. These fringes are well developed on S3–5 in *Rhinepeolus*, only on S5 in *Thalestria*, on S3–5 or S4–5 in *Triepeolus*, and on S3–5 or S3–4 in *Doeringiella s. str.* In most *Pseudepeolus* the fringes are rudimentary, the hairs being straight and barely surpassing the apex of the sterna (9). Michener (2000) indicated this feature as an apomorphy of *Pseudepeolus*, but the species *D. willinki* has well developed fringes on S3–4. Another feature indicated as apomorphic for the subgenus (Michener 2000) is the interrupted carina that borders the basitibial plate (10). Such a carina is complete in *D. (P.) willinki* and *D. (P.) carinata*.

Doeringiella albifrons and *D. angustata* are grouped by the shape of the paraocular carina, which separates from the eye margin above the level of the antennal socket and then approaches again and ends near the upper fifth of the eye, enclosing a bare area (11). This feature is not seen in the outgroups, which have the carina more or less parallel to the eye margin, as is the case in *D. willinki* and *D. carinata*. In *D. fasciata* the paraocular carina is intermediate, ending somewhat separated from the eye margin; this condition has been coded as plesiomorphic, but can be seen as transitional to the stage found in *albifrons* and *angustata*. These two species also share a marked reduction of the squamiform, appressed pubescence characteristic of most epeolines, the notaular spots and the transverse mesepisternal band being nearly absent (12).

KEY TO SPECIES OF SUBGENUS *PSEUDEPEOLLUS* HOLMBERG

- 1 T2–3 with yellowish apical hair bands reaching posterior margins of terga (Fig. 17). Mesopleuron with dense, coalescent punctation over its entire surface (Figs. 2–3) *D. (Pseudepeolus) fasciata*
- T2–3 with yellowish or whitish apical hair bands separated medially from posterior margins

- of terga (Figs. 14–16). Mesopleuron with punctation irregular; punctures on middle part of mesepisternum separated by interspaces 0.5× their diameter, or more (Figs. 4–7) . . . 2
- 2 T1 extensively whitish pubescent, except dark pubescent on base, apical margin and transverse median oval on disc of tergum (Figs. 15–16). Middle part of mesepisternum with spaces between punctures shiny (Figs. 4–5) 3
- T1 at most with preapical band of pale hairs (Fig. 14). Middle part of mesepisternum with spaces between punctures tessellate (Figs. 6–7) 4
- 3 Paraocular area of female above level of antennal sockets with erect, long hairs, as long as or longer than antennal pedicel, which stand out among appressed, squamiform hairs. Scape of male with entire condylar surface flattened (Fig. 13) . . . *D. (Pseudepeolus) carinata*
- Paraocular area of female above level of antennal sockets without erect, long hairs; at most with a few erect hairs on the uppermost part, shorter than half antennal pedicel length. Scape of male with condylar surface flattened only on proximal half (Fig. 11) *D. (Pseudepeolus) willinki*
- 4 T1 with preapical band of whitish hairs (Fig. 14); T4 with scattered whitish hairs, not forming conspicuous preapical band. Second submarginal cell narrowed anteriorly; anterior margin 0.5× as long as vein r, to distinctly petiolate *D. (Pseudepeolus) angustata*
- T1 with lateral spot of whitish hairs, without preapical band; T4 with preapical band of pale hairs. Second submarginal cell with anterior margin 0.8–0.9× as long as vein r *D. (Pseudepeolus) albifrons*

Doeringiella (Pseudepeolus) fasciata
(Holmberg)
 (Figs. 2–3, 8–10, 12, 17)

Pseudepeolus fasciatus Holmberg 1886: 285–286 (Holotype ♂, Formosa, IV-1885, destroyed). Neotype ♂, Argentina, Formosa, Riacho Pilagá, Ruta 11, 26 Km N Formosa, 11–12-VIII-1977, C. Porter, L. Stange, P. Fidalgo (MACN, present designation). Dalla Torre 1896: 333. Schrottky 1903: 183. Schrottky 1913: 264.

Doeringiella (Pseudepeolus) fasciata: Michener 2000: 630.

This species is easily distinguished by the pale metasomal hair bands reaching the apical margins of the terga (Fig. 17). These bands are present on T1–4 in the female and on T1–6 in the male. The pale hair bands, when present, are preapical in the other species of *Pseudepeolus*. *Doeringiella fasciata* is also characterized by the dense, close punctation of the integument (Figs. 2–3).

Based on Holmberg’s (1886) detailed description it is possible to recognize this species with certainty, in spite of the loss

of the type specimen. Nevertheless, with the purpose of fixing the meaning of the genus-level name *Pseudepeolus* Holmberg, I here designate a neotype specimen from the same geographical area of the lost type.

I have examined nearly fifty specimens of *D. fasciata* from several localities (Fig. 18), and most specimens have three submarginal cells. The few that present two submarginal cells, sometimes only on one wing, always have a rudiment of the crossvein 1r-m.

Male neotype.—Length 7.5 mm; length of forewing 7.0 mm. Punctures on scutum and scutellum (diameter 0.020–0.030 mm) coalescent; punctures on mesopleuron (diameter 0.025–0.035 mm) coalescent over its entire surface. Proportion of lower to upper interocular distance, 0.77:1. Proportion of interantennal to antennocular distance, 1.9:1. Elevation between antennal sockets bearing sharp, elevated frontal carina, which reaches anterior ocellus. Paraocular carina ending somewhat separated from eye margin near upper fifth of eye. Proportion of postocellar to ocellocu-

lar distance, 0.8:1. Proportion of scape, pedicel and first three flagellomeres, 2.75:0.8:1:1.5:1.2. Scape strongly flattened (Fig. 12), with transverse median section triangular, without erect, long hairs; upper rim of condylar surface carinate. Labrum 1.7× as broad as long, with two median tubercles and three apical denticles, lateral ones somewhat carinate. Scutellum bigibbous, with longitudinal median impression; axilla short, base of axilla as long as outer margin. Second submarginal cell with anterior margin 0.33 (right)–0.2 (left)× as long as vein r. Apical fringes on S3–4 with straight hairs surpassing posterior margins of sterna, similar to that on S5. Pygidial plate with apical two thirds parallel-sided, apex rounded.

Distribution.—Argentina: Provinces of Formosa and Misiones. Brazil: States of Mato Grosso, Minas Gerais and São Paulo.

Material studied.—ARGENTINA. *Formosa*: ♂ Neotype, Riacho Pilagá, Ruta 11, 26 Km N Formosa, 11–12-VIII-1977, C. Porter, L. Stange, P. Fidalgo (MACN); 2 ♀ and 2 ♂, Riacho Pilagá, Ruta 11, 26 Km NO Formosa, 11-VIII-1977, C. Porter, L. Stange, P. Fidalgo (FIML). *Misiones*: 1 ♀ and 1 ♂, Monte Carlo, 12-VIII-1974, C. Porter, L. Stange (AMNH); 1 ♂, Loreto, 17-III-1949, A. Ogloblin (MLP). BRAZIL. *Mato Grosso*: 1 ♀ and 2 ♂, Itaum, Dourados, III-1974, M. Alvarenga (AMNH); 1 ♂, Rio Caraguatá, III-1953, F. Plaumann (MLP). *Minas Gerais*: 5 ♀ and 11 ♂, Araxá, III-1965 and IV-1965, C. & T. Elias (UFPR); 2 ♀ and 4 ♂, Passos, IV-1961, 1–7-IV-1962, 10–14-IV-1962 and IV-1963, C. Elias (UFPR); 5 ♂, Ibiá, 11–18-III-1965, C. Elias (UFPR); 1 ♀, Santa Rita de Cássia, V-1961, C. Elias (UFPR); 1 ♀ and 2 ♂, Sacramento, 26-III-1965, C. & T. Elias (UFPR). *São Paulo*: 1 ♀, Ribeirão Preto, 29-V-1972, P.S. Moraes (USP-RP); 1 ♂, Cajuru, 6-IV-1985, Mazucato-Camargo (USP-RP).

Doeringiella (Pseudepeolus) albifrons
(Smith), n. comb.

Epeolus albifrons Smith 1879: 104. Type ♀, Pará, Brazil (London, examined). Dalla Torre 1896:

327 (erroneously cited from "Paraná"). Schrottky 1903: 183 (idem). Schrottky 1913: 264 (erroneously cited from "Entre Ríos"). Duce 1910: 103.

This species is distinguished by the reduction of the squamiform pubescence of the body. The metasomal bands of pale pubescence are very narrow on T2–3, and that on T1 is reduced to a small lateral spot; on T4 there is no defined band. The notaular spot and the transverse mesepisternal band, usually conspicuous in species of *Doeringiella*, are obsolescent. The punctation in *D. albifrons* is sparser than in the other species, see comments under *D. angustata*.

Female type.—Pattern of pale pubescence on metasoma as follows: T1 with lateral spot of yellowish hairs, no preapical band, T2–4 with narrow preapical band of yellowish hairs, T1–5 laterally with scattered whitish squamiform hairs. Punctures on hypoepimeral area separated by 0.2–0.5× their diameter, interspaces tessellate, below this area with band of dense punctures, and below this band punctures separated by tessellate interspaces, which in front of the middle coxa are 2 to 3× a puncture diameter. Punctures around ocelli small, dense, strongly contrasting with those of mesopleuron; narrow interspaces shiny. Proportion of lower to upper interocular distance, 0.78:1. Proportion of interantennal to antennocular distance, 1.75:1. Proportion of postocellar to ocellular distance, 0.8:1. Paraocular carina separating from eye margin above level of antennal socket, then approaching again and ending near upper fifth of eye, enclosing bare area. Proportion of scape, pedicel and first three flagellomeres, 2.1:0.5:1:1.3:1.1. Labrum twice as broad as long, with two median tubercles and three apical denticles, lateral ones somewhat carinate, median one obsolescent. Scutellum bigibbous, with longitudinal median impression; axilla short, base of axilla as long as its outer margin. Basitibial plate

poorly defined, bordering carina interrupted apically. Second submarginal cell with anterior margin $0.8\times$ as long as vein r. S5 with apex not bent down.

Distribution.—Perú: Department of Loreto. Brazil: State of Pará.

Material studied.—BRAZIL. *Pará*: 1 ♀ type (London). PERÚ. *Loreto*: 1 ♀, Pucallpa, 22-XII-1950, J.M. Schuncke (London).

Doeringiella (Pseudepeolus) angustata

Moure

(Figs. 6–7, 14)

Doeringiella (Stenothisa) angustata Moure 1954: 278–280, Fig. f. Syntypes 1 ♀ and 4 ♂, Curitiba, Paraná, Brasil (UFPR, examined).

Pseudepeolus angustatus: Roig Alsina 1989: 578. Roig Alsina 1991: 37.

Doeringiella (Pseudepeolus) angustata: Michener 2000: 630.

I consider tentatively this species as different from *D. albifrons*, until the study of more specimens allows a better interpretation of the variation of characters like wing venation, pubescence pattern, and sculpture of the integument. *Doeringiella albifrons* and *D. angustata* are morphologically similar. They share apomorphies such as the apically interrupted basitibial plate of the female, the paraocular carina conspicuously separated from the eye margin above the level of the antennal sockets, and the reduction of the pale pubescence. *Doeringiella angustata* is distinguished from *D. albifrons* by the presence of a pale preapical band of hairs on T1 (Fig. 14), as well as on T4, and by the denser punctation. In both species the punctation on the middle and lower parts of the mesopleuron is irregular, leaving tessellate interspaces (Figs. 6–7), but in *D. angustata* the punctures in front of the middle coxa are separated at most by $1\text{--}1.5\times$ a puncture diameter, while in *D. albifrons* the interspaces can be 2 to $3\times$ a puncture diameter. The interspaces on the frons and the scutum are dull and tessellate in *D. angustata*, but shinier and scarcely tessellate in *D. albifrons*.

Moure (1954) gives a detailed description of this species. The narrowing of the anterior margin of the second submarginal cell varies among individuals, as well as between the left and right forewing of some individuals; it varies from half as long as vein r to distinctly petiolate.

Distribution.—Brazil: States of Paraná, Santa Catarina and São Paulo.

Material studied.—BRAZIL. *Paraná*: type series, Curitiba, XI-1951, III-1953, XII-1953, I-1954, J.S. Moure (UFPR); 1 ♀, Alto Amparo, 2-IV-1967, P.D. Hurd (USNM). *Santa Catarina*: 1 ♀, Nova Teutonia, II-1952, F. Plaumann (MACN). *São Paulo*: 1 ♀, Itapeva, IV-1957, K. Lenko (UFPR).

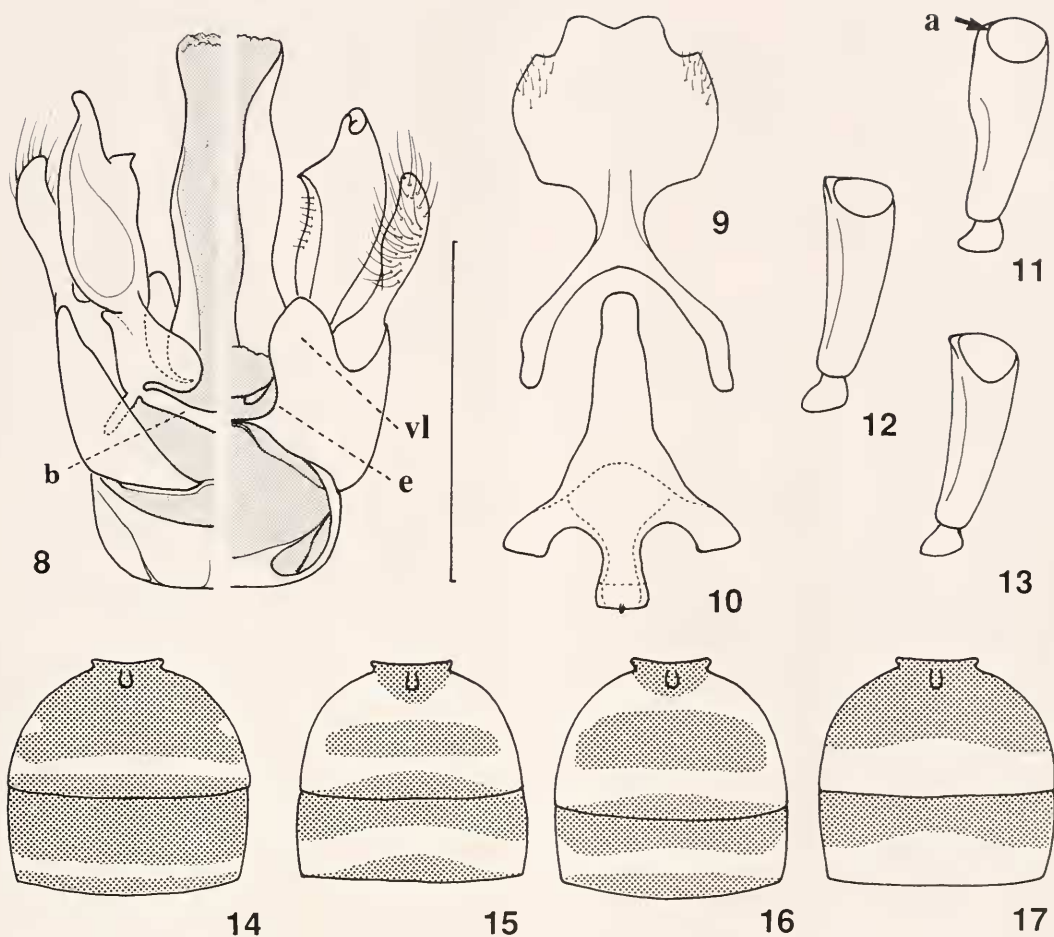
Doeringiella (Pseudepeolus) carinata

Roig-Alsina, sp. n.

(Figs. 4–5, 13, 16)

Diagnosis.—This species is distinguished by the transverse oval of dark pubescence surrounded by pale pubescence on T1 (Fig. 16), by the basitibial plate of the female with a complete apical margin, and by the shiny interspaces between punctures on scutum and mesopleuron. This species resembles *D. willinki* in the punctation and the vestiture pattern, but the transverse dark oval on T1 is smaller in *D. willinki* (Fig. 15). The male is easily distinguished from *D. willinki* by the scape with the entire condylar surface flattened, and the poorly developed apical fringes on S3–4, which have straight hairs; the female is distinguished by the strong frontal carina, the elevation between the antennal sockets having distinctly concave sides, and by the pubescence on the face, as mentioned in the key.

Male holotype.—Length 8.3 mm (paratypes, 7.5–9.0 mm); length of forewing 7.0 mm (paratypes, 6.6–7.3 mm). *Coloration*. Body black; except: scape, pedicel, first flagellomere and base of second, pronotal lobe, tegula and posterolateral angle of scutum pale reddish brown; condylar surface of antenna beyond base of second flagellomere brown; legs reddish brown be-



Figs. 8–17. *Doeringiella* (*Pseudepeolus*) spp. 8–10, *D. fasciata*, ♂. 8, Genital capsule (left, dorsal; right, ventral): b = dorsal bridge of penis valves; vl = ventral lobe; e = emargination. 9, S7, ventral. 10, S8, ventral. 11–13, Scape of ♂. 11, *D. willinki*: a = point of articulation of the pedicel. 12, *D. fasciata*. 13, *D. carinata*. 14–17, T1–2 of ♀, dark and pale pubescence represented by shaded and white areas respectively. 14, *D. angustata*. 15, *D. willinki*. 16, *D. carinata*. 17, *D. fasciata*. Scale Figs. 8–10 = 1 mm.

yond apices of coxae; mandible and pygidial plate dark reddish brown. Wings moderately infuscated except pale spot on forewing at end of closed cells; veins and pterostigma brown. *Vestiture*. Appressed, dense, whitish on: face around antennal sockets, gena close to upper third of eye; pronotal band including posterior margin of pronotal lobe; triangular notalular spot (broad close to pronotum); posterolateral angle of scutum; posterior median spot and lateral spot below axilla on scutellum; median and lateral spot on metanotum; T1

extensively, except dark spot surrounding metasomal articulation, dark apical margin and dark transverse median oval on disc of tergum, which is 3.2× broader than long (Fig. 16); T2–4 with broad apical pale bands, separated medially from margins of terga; T5–6 with broad apical pale bands. Greyish white, sparser pubescence on: clypeus, supraclypeal area, anterolateral angle of scutum, mesepisternum anteriorly, broad mesepisternal band, metapostnum laterally, postero-lateral angle of propodeum, underside of thorax, outer

surfaces of coxae, tibiae and basitarsi, and S2–5. Apical fringes on S3–4 with hairs slightly curved or straight, surpassing posterior margins of sterna. Remainder of head and thorax with sparse pale pubescence, except brownish on scutum. Pubescence of metasoma, other than mentioned pale maculations, brownish black. Posterior surface of propodeum mostly glabrous, with hairs restricted to postero-lateral angle. *Sculpture*. Punctures on scutum and scutellum (diameter 0.025–0.030 mm) separated by 0.2–0.5 \times their diameters, closer along the midline, interspaces smooth, shiny; punctures around ocelli smaller, also separated by 0.2–0.5 \times their diameter; middle of mesepisternum, below transverse band of hairs, with larger punctures (diameter 0.035–0.050 mm), also with smooth, shiny interspaces (Figs. 4–5); metapostnotum tessellate, dull, rugose close to metanotum; posterior surface of propodeum slightly tessellate, shiny. T1–5 with even, very small punctures, apical margins polished. *Morphology*. Eyes convergent below, proportion of lower to upper interocular distance, 0.74:1. Proportion of interantennal to antennocular distance, 1.6:1. Elevation between antennal sockets with sides concave, bearing sharp, elevated frontal carina. Paraocular carina ending near upper fifth of eye, slightly separating from eye margin above level of antennal socket. Proportion of postocellar to ocellular distance, 0.9:1. Proportion of scape, pedicel and first three flagellomeres, 3:0.75:1:1.25:1.10. Scape strongly flattened (Fig. 13), with transverse median section trianguliform, without erect, long hairs; upper rim of condylar surface carinate. Labrum 1.85 \times as broad as long, with two median tubercles and three apical denticles, lateral ones somewhat carinate. Scutellum bigibbous, with longitudinal median impression; axilla short, base of axilla as long as outer margin. Second submarginal cell with anterior margin 0.45 \times as long as vein r. Pygidial plate with apical

two thirds nearly parallel-sided, apex rounded.

Female.—Length 8.8–9.0 mm; length of forewing 7.0–9.0 mm. Vestiture and coloration similar to those of male but dense whitish pubescence on face restricted to that around antennal sockets; clypeus and upper part of paraocular area with erect, stiff hairs as long as pedicel diameter. T6 with whitish pubescence surrounding dark pseudopygidial area. Punctuation similar to that of male. Proportion of scape, pedicel and first three flagellomeres, 2.3:0.6:1:1.5:1.3. Base of hind tibia with transverse carina forming apex of poorly defined basitibial plate. Second submarginal cell with anterior margin 0.4–0.7 \times as long as vein r. Fifth sternum with apex not bent down. Pseudopygidial area trapezoidal, as long as apical width.

Distribution.—Paraguay: Department of Cororo. Brazil: States of Bahia, Mato Grosso and São Paulo.

Material studied.—Male holotype: PARAGUAY, Río Ypané, Cororo, II-1979, M. Fritz (MACN). The following are paratypes: BRAZIL. *Bahia*: 1 σ , Maracás, II-1963, F.M. Oliveira (UFPR). *Mato Grosso*: 1 σ , Rio Caraguatá, III-1953, F. Plaumann (UFPR). *São Paulo*: 1 ♀ and 1 σ , Cajuru, 6-IV-1985, Mazucato-Camargo (USP-RP); 1 ♀ , Cassia dos Coqueiros, 12-IV-1986, M. Mazucato (USP-RP).

Doeringiella (Pseudepeolus) willinki

Roig-Alsina, sp. n.

(Figs. 11, 15)

Diagnosis.—This species is recognized by the extended pale maculations, more extended than in any other species of the subgenus. It has a well developed mesepisternal band, conspicuous notaular spots, and broad metasomal bands. It can be confused with *D. carinata*, which has a similar pattern of pubescence (see comments in the diagnosis of this species). *Doeringiella willinki* is distinguished from other *Pseudepeolus* by features that represent plesiomorphies within the subgenus:

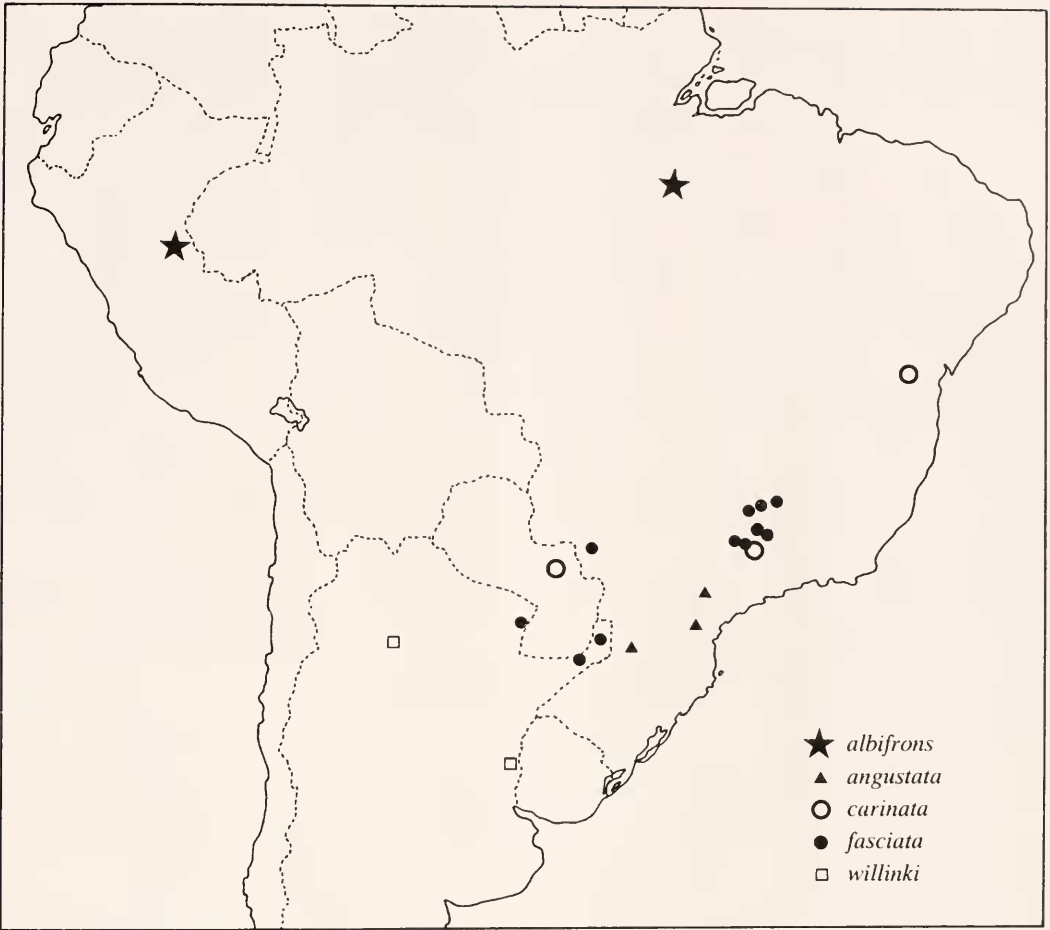


Fig. 18. Map showing distributions of *Doeringiella* (*Pseudepeolus*) spp. in South America.

the scape of the male is flattened only on the proximal half, its upper margin not being carinate, and the male S3-4 bear apical fringes of long, curved hairs.

Female holotype.—Length 8.8 mm; length of forewing 6.0 mm. *Coloration*. Integument of head, thorax and abdomen black; the following parts pale reddish brown: base of mandible, scape, pronotal lobe and tegula; antenna beyond scape brown; legs reddish brown beyond coxae, including tibial spurs. Wings amber, infuscated apically beyond closed cells; veins and pterostigma brown. *Vestiture*. Appressed, dense, yellowish white on the following parts: face around antennal sockets, pronotal band excluding pronotal lobes, tri-

angular notalular spot (broad close to pronotum), posterolateral angle of scutum, posterior median spot and lateral spot below axilla on scutellum, median and lateral spot on metanotum, T1 extensively (except dark base, apical margin and transverse median oval on disc of tergum, Fig. 15), and apical broad bands on T2-4, separated medially from margins of terga. With greyish white, sparser pubescence on: clypeus, supraclypeal area, gena, around pronotal lobe, mesepisternum anteriorly and broad mesepisternal band, metapostnum laterally, postero-lateral angles of propodeum, underside of thorax, outer surfaces of coxae, tibiae and basitarsi, T5 laterally, and apical bands on S2-4.

Remainder of body with sparse pale pubescence, except brownish on scutum. Posterior surface of propodeum mostly glabrous, with hairs restricted to posterolateral angles. *Sculpture*. Punctures around ocelli small, coalescent; on scutum and scutellum punctures (diameter 0.025 mm) separated by 0.2–0.5 \times their diameter, interspaces smooth, shiny; mesepisternum below transverse band of hairs with larger punctures (diameter 0.03–0.04 mm) also with smooth, shiny interspaces; metapostnotum tessellate, dull; posterior surface of propodeum slightly tessellate, shiny. T1–4 with even, very small punctures, and polished apical margins. *Morphology*. Eyes convergent below, proportion of lower to upper interocular distance, 0.73:1. Proportion of interantennal to antennocular distance, 1.7:1. Elevation between antennal sockets with sides slightly concave, bearing frontal carina, which reaches anterior ocellus. Paraocular carina ending near upper third of eye in a blunt, punctured sector. Proportion of postocellar to ocellular distance, 0.9:1. Proportion of scape, pedicel and first three flagellomeres, 2.5:0.75:1: 1.5:1.25. Scape not flattened, with transverse median section roundish, without erect, long hairs. Labrum 1.8 \times as broad as long, with two median tubercles and three apical denticles, of which the lateral ones somewhat carinate and the median one obsolescent. Scutellum bigibbous, with longitudinal median impression; axilla short, base of axilla as long as its outer margin. Base of hind tibia with transverse carina forming apex of poorly defined basitibial plate. Second submarginal cell with anterior margin 0.8 \times as long as vein r. Fifth sternum with apex not bent down. Pseudopygidial area trapezoidal, 0.8 \times as long as its apical width.

Male.—Length 9.2 mm; length of forewing 6.3 mm. Vestiture and coloration similar to those of female but clypeus and labrum with dense whitish pubescence similar to that around antennal sockets; T5 and T6 with apical hair bands, that on T5

separated medially from margin of tergum; base and sides of pygidial plate with brown hairs; S3–4 with whitish apical fringes of curved, long hairs surpassing posterior margins of sterna. Punctuation and proportions of head similar to those of female. Scape compressed on proximal half, where the condylar surface is flattened and somewhat concave (Fig. 11); upper rim of scape not carinate near point of pedicel articulation. Proportion of scape, pedicel and first three flagellomeres, 2.5:0.75:1:1.25:1. Second submarginal cell with anterior margin 0.5–0.7 \times as long as vein r.

Distribution.—Argentina: Provinces of Entre Ríos and Tucumán.

Material studied.—♀ holotype: ARGENTINA, *Entre Ríos*, Pronunciamiento, no date, Zelich (MACN). *Tucumán*: 1 ♂ paratype, 11 Km N Las Cejas, 22-II-1968, L. Stange (IFML).

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